

REMARKS

Claims 1, 3-11, and 15-17 are pending. Claims 1, 3-11, and 15-17 stand rejected. By virtue of this response, no claims have been cancelled, amended, or added. Accordingly, claims 1, 3-11, and 15-17 are currently under consideration. Reconsideration and allowance of the pending claims in light of the remarks presented herein are respectfully requested.

For the Examiner's convenience, Applicants' remarks are presented in the same order in which they were raised in the Office Action.

Claim Rejections under 35 USC §103

A. Claims 1, 3-11, and 16-17 stand rejected under 35 U.S.C. 103(e) over U.S. Patent No. 6,040,588 to Koide et al. (hereinafter "Koide") in view of U.S. Patent No. 6,130,446 to Takeuchi et al. (hereinafter "Takeuchi"), and U.S. Patent No. 4,707,216 to Morkoc et al. (hereinafter "Morkoc").

Applicants respectively traverse the rejection and submit that Koide in view of Takeuchi and Morkoc fail to disclose or suggest a gallium nitride compound semiconductor light-emitting diode as presently recited by claim 1. In particular, the references taken alone or in combination fail to disclose or suggest a gallium nitride compound semiconductor light-emitting diode having, among other features, an n-type transmissive electrode and p-type transmissive electrode that "transmit light which is generated in the active layer and reflected from the substrate so that light exits the light emission device."

Initially, it is noted that Koide does not disclose an n-type electrode as asserted by the Examiner. Rather, Koide discloses an n-type electrode pad 9 formed on n-type layer 3a (see, Fig. 1, col. 4, lines 33-38 and col. 5, lines 64-65). In any event, the Examiner admits that Koide fails to disclose an n-type transmissive electrode that is substantially transparent as recited by the present claims (see page 3, lines 5-6 of the Office Action). The Examiner states that Morkoc teaches a LED having an "n-type electrode 522 and p-type electrode 521, fig. 5, that are light transmissive, column

7, lines 13-15,” and that it would have been obvious to combine the disclosure of Morkoc with Koide because the transmissive electrodes “would have allowed the light to pass through.” (see page 3, lines 7-11 of the Office Action). The structure of the LED device disclosed in Morkoc, however, is entirely different than the structure of the device disclosed by Koide or the structure recited by the present claims. For example, Morkoc discloses a GaAs (not GaN light emitting diode) having electrodes 521 and 522 on opposing sides of the substrate 511 and active layer. Accordingly, the electrodes 521 and 522 of Morkoc do not transmit light reflected from the substrate because they are on opposite sides of the substrate and active layer. Thus, the combination fails to teach all the features of the present claims.

Additionally, the Examiner has failed to provide evidence showing why one skilled in the art would have combined and modified the references to meet the features of the present claims. The Examiner’s proposed motivation for the combination, “because it would have allowed the light to pass through,” is not persuasive in this instance. The transparent electrodes 521 and 522 of Morkoc do not serve similar purposes or solve similar problems, e.g., allowing light reflected from the substrate to pass, and would therefore not have been combined with Morkoc to meet the features of the present claims. Therefore, Applicants submit the Examiner has not provided a sufficient teaching or motivation that suggests the modification to Koide or the desirability of the features of the present claims. Accordingly, the combination of Koide and Morkoc do not teach or suggest that the n-type and p-type electrodes 521 and 522 are transmissive to transmit light which is generated in the active layer and reflected from the substrate so the light exits the light emission device as recited by the present claims.

The addition of Takeuchi does not cure the above deficiencies. The n-type electrode 5 of Takeuchi is completely covered by the n-type electrode pad 8, see, e.g., Figure 4E. Regardless of the light transmitting properties of the n-type electrode, the n-type electrode pad 8 is clearly not transmissive to light (see, for example, column 8, lines 22-26 of Takeuchi describing the composition of the pad electrodes). Therefore, Takeuchi (alone or in combination with the other references) does not disclose or suggest a device having n-type and p-type electrodes that are

transmissive so that light exits the light emission device, because light is not transmitted through the electrode pads which cover at least the n-type electrode pad of Takeuchi.

Accordingly, at the time of the present invention, one skilled in the art would not have been motivated to make the considerable modifications to Koide in light of Morkoc and Takeuchi to meet the features of claim 1. Applicants submit the rejection should therefore be withdrawn. The dependent claims are allowable over the rejections for at least similar reasons as claim 1.

B. Claim 15 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Koide in view of Morkoc and U.S. Patent No. 5,309,001 to Watanabe et al. (hereinafter "Watanabe").

Claim 15 recites a gallium nitride compound semiconductor light-emitting diode having an n-type transmissive electrode and p-type transmissive electrode that "transmit light which is generated in the active layer and reflected from the substrate so that light exits the light emission device." This feature is similar to that recited in claim 1, and is allowable over the references Koide and Morkoc for at least similar reasons as claim 1 discussed herein. The addition of Watanabe fails to cure the deficiencies of Watanabe, nor is Watanabe alleged to.

Accordingly, the rejection to claim 15 should be withdrawn and claim 15 allowed.

CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 299002051900. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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Respectfully submitted,

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